1. INTRODUCTION

1.1 PURPOSE AND NEED FOR U.S. DEPARTMENT OF ENERGY ACTION

The proposed action evaluated in this Environmental Assessment (EA) is to implement environmental corrective measures in Quadrant II of the U.S. Department of Energy's (DOE) Portsmouth Gaseous Diffusion Plant (PORTS) located in Piketon, Ohio. The environmental corrective measures are necessary to comply with the DOE signed agreements with the U.S. Environmental Protection Agency (EPA) and the Ohio Environmental Protection Agency (Ohio EPA) that require DOE to conduct Resource Conservation and Recovery Act (RCRA) corrective measures at PORTS near Piketon, Ohio.

Both U.S. EPA and Ohio EPA agreed during a December 12, 1994, Decision Team meeting that a site-wide program plan would be developed to provide a general framework for controlling and implementing corrective action alternatives at PORTS. The program plan would then be supplemented by a Solid Waste Management Unit (SWMU) specific Corrective Measures Implementation (CMI) program plan for each corrective action. The plant was divided into four quadrants (based generally on groundwater flow directions) to help focus and time-phase these efforts.

The environmental restoration program at PORTS is the subject of two compliance agreements. The State of Ohio and DOE filed a Consent Decree on September 1, 1989, and the U.S. EPA Region V and DOE entered into an Administrative Consent Order (ACO) on September 27, 1989, for the performance of response action/corrective actions at PORTS. An amendment to that order was issued in August, 1994. On August 12, 1997, the DOE, Ohio EPA, and U.S. EPA entered into an Administrative Consent Order for the purpose of defining oversight roles for Ohio EPA and U.S. EPA and certain performance obligations for DOE, which replaced the earlier version of the ACO, as amended. Pursuant to this Administrative Consent Order, Ohio EPA assumed the lead oversight role from U.S. EPA for all remedial and corrective action activities at PORTS. Among various deliverables, the Ohio Consent Decree requires a Cleanup Alternatives Study (CAS) and the U.S. EPA Administrative Consent Order requires a Corrective Measures Study (CMS). The Ohio EPA and U.S. EPA have agreed to a single document, a CAS/CMS report, to fulfill the requirements for these essentially equivalent deliverables.

The Quadrant II CAS/CMS (DOE 2001e) report issued on February 28, 2001, and two addenda, one issued on December 4, 2001 (DOE 2001f) and the other issued June 25, 2002 (DOE 2002), which are incorporated herein by this reference, are available for public review at the DOE Information Center located at 3930 U.S. 23, Piketon, Ohio with the point of contact being Janie Croswait. After review of the potential alternative corrective measures, Ohio EPA will issue a Quadrant II Decision Document identifying the preferred alternative(s). This Decision Document has not been issued at this time. As a result, a bounding analysis was performed which covers all of the corrective measures scenarios discussed in the CAS/CMS. If corrective measures are selected for Quadrant II that are outside of the scope of this bounding analysis, additional NEPA evaluation may be required. A copy of the Executive Summary from the Quadrant II CAS/CMS is included in Appendix E.

The Quadrant II CMI Program Plan will include specific activities outlined in the Quadrant II Decision Document. A schedule for accomplishing the construction tasks will also be included. This SWMU specific plan, along with the generic CMI Program Plan, will summarize the activities to be conducted to ensure compliance with federal, state, and local regulations, and applicable or relevant and appropriate requirements (ARARs) which will be outlined in the Decision Document. The Ohio EPA is expected to issue the Decision Document in 2003.

1.2 BACKGROUND

PORTS is one of only two federally owned, privately operated uranium enrichment facilities in the United States. The uranium enrichment production and operations facilities at the site are owned by DOE and leased to the United States Enrichment Corporation (USEC). DOE's management and integration contractor, Bechtel Jacobs Company LLC (BJC), is responsible for environmental restoration, waste management, and operation of non-leased facilities (facilities not leased to USEC) (DOE 1999a). Martin Marietta Energy Systems, Inc., and its successor company Lockheed Martin Energy Systems, Inc., was the management contractor for DOE from November 1986 through March 1998. On April 1, 1998, BJC assumed responsibility for environmental restoration, waste management, and operation of non-leased facilities (facilities that are not leased to USEC) at PORTS as the environmental management contractor for DOE. PORTS is located in a rural area of Pike County in south central Ohio, on a 9.3-km^2 (5.8-$mile^2$) site (Figs. 1.1 and 1.2). The nearest residential center in this area is Piketon, which is about 8.1 km (5 miles) north of the plant on U.S. Route 23. The county's largest community, Waverly, is about 16.1 km (10 miles) north of the plant. Additional population centers within 80.5 km (50 miles) of the plant are Portsmouth, 43.5 km (27 miles) south; Chillicothe, 43.5 km (27 miles) north; and Jackson, 41.9 km (26 miles) east.

1.3 PORTS HISTORY

PORTS has been in operation since 1956 as an active uranium enrichment facility supplying enriched uranium for government and commercial use. Initially, PORTS was needed to provide U^{-235} at assays above those of the other production facilities at Oak Ridge, Tennessee, and Paducah, Kentucky for research and military applications including material to be used in the fabrication of fuel for nuclear powered U.S. Navy vessels. In the late 1970s, PORTS was chosen as the site for a new enrichment facility using gas centrifuge technology. Construction of the Gas Centrifuge Enrichment Plant (GCEP) began in 1979 but was halted in 1985 because the demand for enriched uranium decreased.

In 1991, DOE suspended production of highly enriched uranium (HEU) for the U.S. Navy at PORTS. The plant continued to produce only low-enriched uranium for use by commercial nuclear power plants until May of 2001 (DOE 1999a; ORNL 1999).

In accordance with the Energy Policy Act of 1992, USEC, a newly created government corporation, assumed full responsibility for uranium enrichment operations at PORTS on July 1, 1993. DOE retains certain responsibilities for decontamination and decommissioning (D&D), waste management, depleted UF_6 cylinders, and environmental remediation. USEC subsequently became a publicly held private corporation on July 28, 1998 (DOE 1999a; ORNL 1999).

1.3.1 Uranium Enrichment Activities at PORTS

The uranium enrichment production and operations facilities at PORTS are leased to USEC and are located on approximately 259 hectares (ha) (640 acres) within the 1503-ha (3714-acre) DOE reservation. In addition to the three gaseous diffusion process buildings, extensive support facilities were required to maintain the diffusion process. The support facilities include administration buildings, a steam plant, electrical switchyards, cooling towers, cleaning and decontamination facilities, water and wastewater treatment plants, fire and security headquarters, maintenance, warehouse, and laboratory facilities.

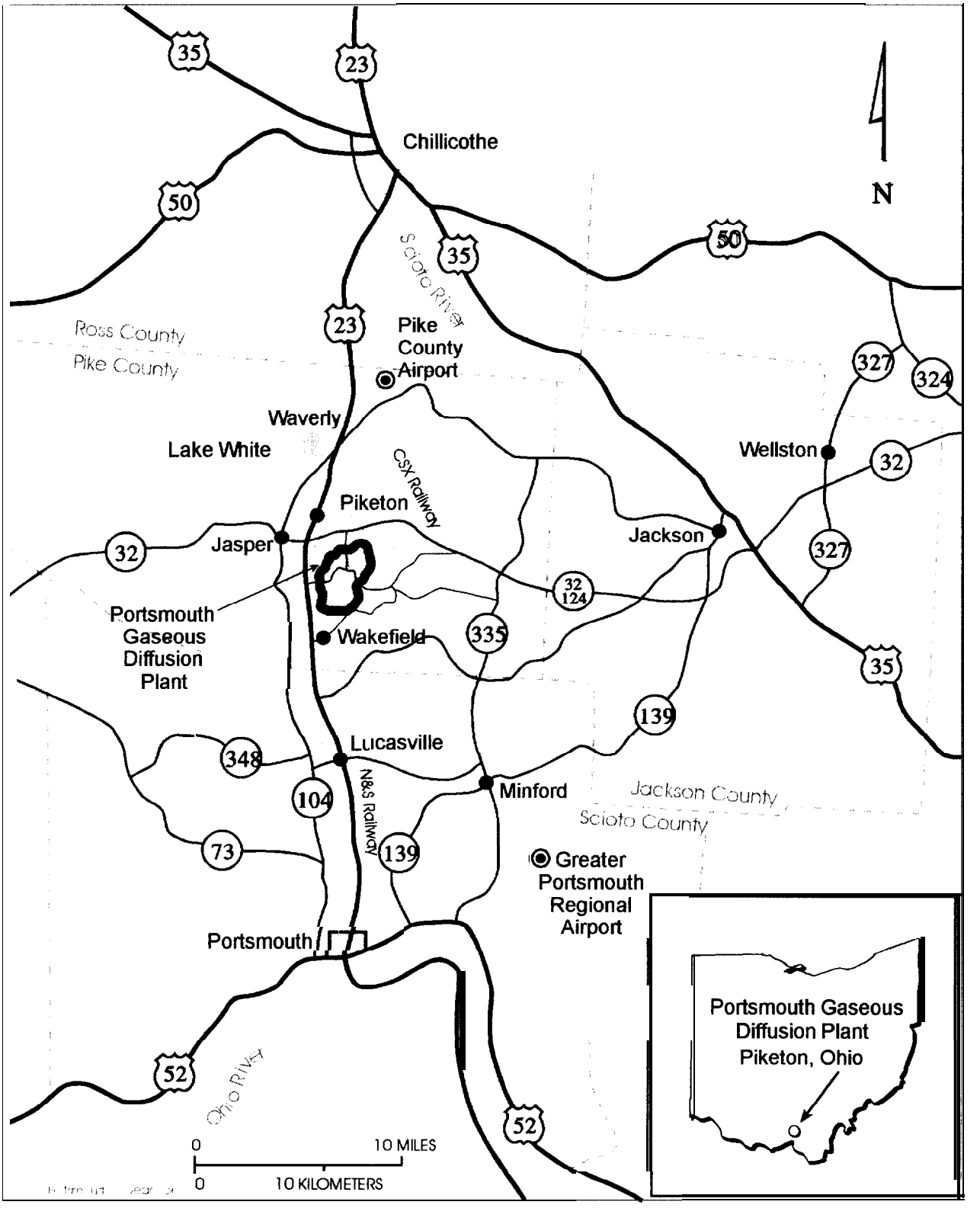

Fig. 1.1. Location of PORTS in relation to the geographic region.

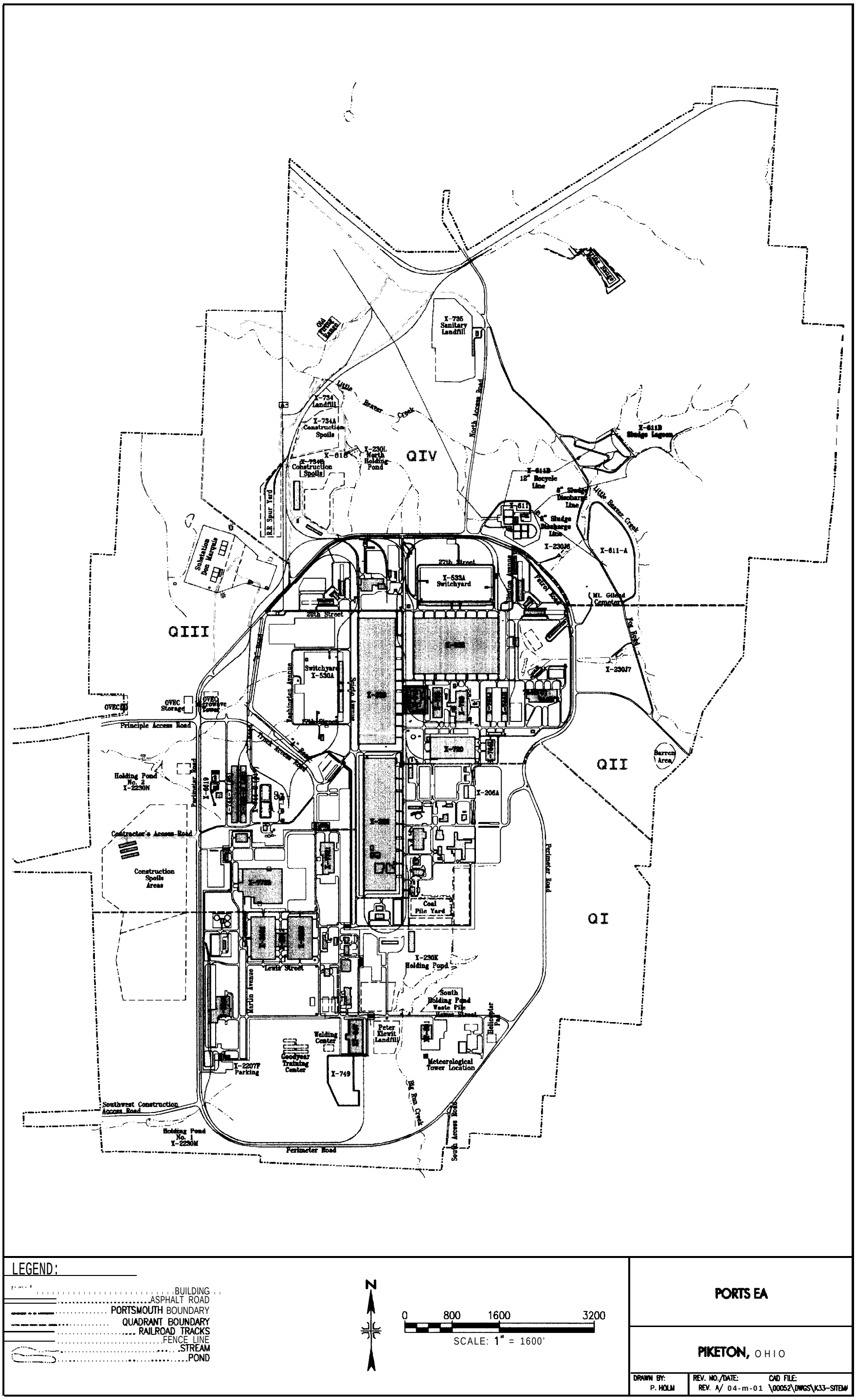

Fig. 1.2. FORTS environmental assessment area.

On June 21, 2000, USEC announced that it would cease uranium enrichment operations at PORTS starting in June 2001 (USEC 2000). Since USEC's announcement, DOE proposed placing the GDP in cold standby (see Sect. 4.14.1 for a definition of cold standby). This was approved and the uranium enrichment process equipment was shutdown and placed in cold standby in May 2001. It is anticipated that USEC will continue to operate its transfer and shipping facilities at PORTS until September 2003 after the cessation of enrichment operations.

1.3.2 Environmental Restoration at PORTS

The DOE-PORTS Environmental Restoration Program was developed in 1989. Site cleanup is managed in accordance with RCRA, amended in 1984 by the Hazardous and Solid Waste Amendments. Other applicable laws include the CERCLA of 1980, amended in 1986; Toxic Substances Control Act of 1976 (TSCA); Clean Water Act of 1972 (CWA); and Clean Air Act of 1970 (CAA). Oversight of cleanup activities at PORTS is conducted by the Ohio EPA and U.S. EPA under the directive of a Consent Decree between the State of Ohio and DOE, issued on August 29, 1989, and an ACO between DOE, Ohio EPA, and the U.S. EPA, issued on September 17, 1989 (amended in 1994 and 1997) (DOE 1999a). The site is divided into quadrants based on groundwater flow patterns to facilitate the investigation and cleanup.

In 1998, DOE submitted a CAS/CMS for two of the quadrants. The Ohio EPA and U.S. EPA approved the CAS/CMS for Quadrant III on July 13, 1998, and Quadrant IV on October 18, 1998. The Quadrant I CAS/CMS was submitted to Ohio EPA and U.S. EPA and was approved on June 12, 2000. The Quadrant II CAS/CMS (DOE 2001e) was submitted on February 28, 2001. On August 31, 2001, Ohio EPA notified DOE that some additional alternatives for soil remediation needed to be investigated. An addendum to the Quadrant II CAS/CMS (DOE 2001f) addressing these additional alternatives for soil remediation was submitted to Ohio EPA on December 4, 2001.

1.3.3 Waste and Materials Management at PORTS

DOE-PORTS, through its Waste Management Program, oversees the management of waste generated from DOE operations and from environmental restoration projects. Under the USEC lease agreement, USEC pays DOE for storage of certain wastes such as waste contaminated with radioactivity generated by plant operations. However, USEC is responsible for waste treatment and disposal of wastes generated from their operations. Waste management requirements are varied and often complex because of the variety of wastes generated by DOE-PORTS activities, including radioactive, hazardous (chemical), polychlorinated biphenyls (PCBs), asbestos, industrial, and mixed (radioactive and hazardous) wastes. All DOE waste management activities are conducted in compliance with state and federal regulations. Supplemental policies also have been implemented for waste management. They include:

- minimizing waste generation;
- characterizing and certifying wastes before they are stored, processed, treated, or disposed;
- pursuing volume reduction and use of on-site storage (when safe and cost effective) until a final treatment and/or disposal option is identified; and
- recycling.

1.3.4 Reindustrialization Program

Several ongoing initiatives are underway at PORTS in coordination with the Southern Ohio Diversification Initiative (SODI), the recognized community reuse organization for PORTS. DOE's Office of Worker and Community Transition established community reuse organizations to minimize the negative effects of workforce restructuring at DOE facilities that have played an historic role in the nation's defense. These organizations provide assistance to the neighboring communities negatively affected by changes at these sites. Currently, an EA is being developed for the Reindustrialization Program at PORTS, DRAFT DOE/EA-1346, *Environmental Assessment, Reindustrialization Program at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*. This EA is for a proposed action to transfer real property (i.e., underutilized, surplus, or excess PORTS land and facilities) by lease and/or sale (i.e., donation, transfer to another federal agency, or exchange) via a reindustrialization program. This action is currently on hold.

1.4 SCOPE OF THIS EA

DOE has prepared this EA to present the public with information on the potential impacts associated with the implementation of corrective measures, including additional investigative and monitoring actions, as necessary, to contain and remove environmental contamination at the X-701B Holding Pond and Retention Basins and X-701B Area Groundwater, and reasonable alternatives, as well as to ensure that potential environmental impacts are considered in the decision-making process. DOE is required to assess the potential consequences of its activities on the human environment in accordance with the Council on Environmental Quality (CEQ) regulations (40 *CFR* Parts 1500–1508) implementing National Environmental Policy Act (NEPA) and DOE NEPA Implementing Procedures (10 *CFR* 1021). If the impacts associated with the proposed action are not determined to significantly affect the quality of the human environment as described in this EA, DOE would issue a Finding of No Significant Impact (FONSI). If the impacts are identified as significant, an Environmental Impact Statement may be prepared.

Because the preferred corrective measure actions have not been identified by Ohio EPA and U.S. EPA at this time, all of the reasonably foreseeable corrective measures options as identified in the Quadrant II CAS/CMS and their associated environmental effects are addressed.

This EA (1) describes the existing environment at PORTS relevant to potential impacts of the proposed action and alternatives; (2) analyzes potential environmental impacts; (3) identifies and characterizes cumulative impacts that could result at PORTS in relation to other ongoing or proposed activities within the surrounding area; and (4) provides DOE with environmental information for use in prescribing restrictions to protect, preserve, and enhance the human environment and natural ecosystems.